NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

Accident Date: November 13, 2020

Airframe and Engine Exam N757PY

WPR20LA055

This document contains 16 embedded photos.

A. ACCIDENT

Location: San Bernadino, CA.
Date: November 13, 2020
Aircraft: N 757PY / Cessna 152
NTSB Investigator-in-Charge: Tom Little

On March 23, 2021, the airplane's airframe and engine were examined at the Air Transport Recovery facility, Phoenix, AZ..

B. PARTICIPANTS

Fabian Salazar
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Significant Examination finding:

- Engine data plate info:
  - Eng no. L-20213-15
  - SE792NW
  - Takeoff 5 min: 118 at 2800 RPM
  - Normal: 105/110/112/115 H.P at 2400, 2550, 2600, 2700 RPM
  - Spark Advance: 20°
- Evidence of water was found in the right fuel tank, gascolator, carburetor inlet hose and carburetor bowl.

Fuselage.

- The fuselage was separated into four major sections.
  - The engine and nacelle, engine mounts, fire wall, and nose gear
  - The cabin area including the right wing to the wing strut, complete left wing, and the left and right main landing gear
  - Aft fuselage and empennage
  - The right-wing outboard of the wing strut

Engine nacelle

- Unknown at this time why or when the engine and nacelle were separated from the rest of the fuselage. The separation is at the forward door post and contained the entire instrument panel and components mounted to the instrument panel.

FUSELAGE

Right side (front to back)

The right door was not attached to the fuselage but recovered. The hinges on the fuselage appeared normal and without damage, suggesting the door was removed during recovery. The sheet metal forward of the front door post appeared to have been cut for recovery. The right-wing strut remained attached to the fuselage and the wing and had a large circumferential dent near the tie-down ring that pushed the strut aft. The sheet metal aft of the right door exhibited dents and wrinkling. The fuselage was cut about 30 inches aft of the rear door post, separating the aft fuselage and empennage. All control cables to the empennage were severed. The right-side aft fuselage exhibited denting and wrinkling of the sheet metal near the area where the aft fuselage was separated, suggesting that this area received damage from the accident and breaching the fuselage. The remaining aft fuselage area exhibited minor damage with small dents and wrinkling sheet metal.

Left side (back to front)

The left side of the aft fuselage exhibited minor damage from the end of the empennage to the area where the aft fuselage was separated from the forward fuselage area. The left-side fuselage area behind the left door post was extensively damaged with the sheet metal distorting outwards and the roof top area crushing downwards. The left door remained attached to the fuselage at the hinges.

The bottom of the fuselage, from the main landing gear area to the point where ethe aft fuselage was separated, exhibited substantial damage with large dents and wrinkling of the sheet metal.

Engine nacelle and propeller

The engine, firewall and instrument panel were separated from the fuselage and exhibited substantial damage. The upper cowling was separated from the engine nacelle and recovered. The lower cowling remained attached to the engine nacelle and exhibited minor damage. The propeller remained attached to the engine and exhibited aft bending to one blade to about 4 inches aft of normal. The other blade exhibited minor damage. The metal spinner exhibited minor damage with one dent near the tip.

WINGS

The right wing was separated from the airplane just outboard of the wing strut area. There was substantial damage from the leading edge aft to about mid-chord. The wing strut remained attached at both ends and had substantial damage near the wing mount. The inboard section of right wing remained attached to the upper fuselage at the attachment points. The right flap remained attached to the right wing and appeared in the full up position. The flap exhibited minor damage to the top and bottom but was pushed aft into the fuselage. The separated section of right wing exhibited substantial damage at the separation area with damage to the leading edge extending aft past the wing spar. The aileron remained attached to the right wing at the hinges and articulated up and down with moderate force. The bottom and top of the right wing exhibited damage with wrinkling, denting and punctures throughout its span. The wing tip remained attached and exhibited wrinkling and denting. The right fuel cap remained secure to the fuel cap. When opened the right wing contained a clear fluid that tested positive for water. The right fuel tank and cap exhibited a brownish coating and corrosion that appeared to be rust. The rubber seal was soft and pliable. The right fuel tank was removed for further examination. The bottom of the right tank exhibited corrosion.

The left wing remained attached to the fuselage at the mounting points. The left-wing strut remained attached to the wing and the fuselage and exhibited minor damage. The left aileron remained attached to the wing at the hinges and exhibited substantial damage. The aileron articulated up and down to the full travel with moderate force. The left flap remained attached to the wing at the hinges and appeared to be in the full up position. The flap had damage throughout its span. The upper surface of the left wing exhibited substantial damage with extensive wrinkling and dents running chord-wise from the wing root out to about mid-span. The upper

surface, from mid-span to the wing tip, exhibited minor damage. The lower wing surface exhibited minor damage throughout its span. The wing tip remained attached to the wing and exhibited minor damage. The left fuel cap remained secured to the wing. The rubber seal was soft and pliable. The fuel port had light corrosion and rust on it and the chain. The fuel tank was dry with no evidence of water intrusion.

EMPENNAGE

The right horizontal stabilizer remained attached to the empennage and exhibited minor damage. The right elevator remained attached to the right horizontal stabilizer and exhibited minor damage. The trim tab remained attached to the right elevator and exhibited minor damage, and appeared to be set in a near neutral setting. The vertical stabilizer and rudder remained attached to the empennage. The right side of the vertical stabilizer exhibited minor damage. The right side of the rudder exhibited minor damage. The left side of the vertical stabilizer exhibited minor damage. The left side of the rudder exhibited minor damage with a small wrinkle in the sheet metal near the top hinge. The left horizontal stabilizer and elevator were cut during recovery. Both the horizontal stabilizer exhibited extensive damage to the top and bottom surfaces. The left horizontal stabilizer exhibited upward bending about mid-span with wrinkling around the bends. The left elevator exhibited upward bending with wrinkles running span-wise and chord-wise.

LANDING GEAR

The nose gear remained attached to the engine mounting framework and exhibited minor damage. The right main landing gear remained attached to the strut and exhibited minor damage. The brake assembly remained intact with minor damage. The right landing gear strut remained attached to the fuselage. The left main landing gear strut remained attached to the fuselage and exhibited minor damage. The left wheel separated from the strut and remained attached by the brake hose. The left brake assembly remained intact.

FLIGHT CONTROL CONTINUITY

Flight control continuity was confirmed on the left wing from the aileron to the root of the wing, and from the right aileron to the break in the right wing. At the break in the right wing, the control cables were severed. Control continuity from the severed section of wing was re-confirmed to the root of the wing. The separation of the forward section of the airplane from the fuselage prevented reestablishing control continuity.

Flight control continuity for the rudder and elevators was confirmed from the control surfaces to the breaks in the control cables near the area where the aft fuselage was separated form the forward fuselage. Control continuity was undetermined from the mid-section of the fuselage and the separated forward section of the fuselage.

Throttle and mixture continuity was confirmed from the throttle quadrant to the carburetor.

The cabin area was not compromised. The instrument panel remained attached to the fuselage and exhibited substantial damage. The left and right control yokes were bent. The throttle

remained secured to the throttle quadrant and moved in and out with moderate force. The mixture remained secured to the quadrant and moved freely. Flap lever was secure and in the up position. The trim knob remained secure with no indication of the setting noted. A Hobbs meter was mounted on the instrument panel and read: 2883.3. The tachometer read: 8783.7. The rudder pedals remained attached to this section of the airplane. The key remained in the ignition switch and was in the BOTH position.

Engine Exam

A visual examination of the outside of the engine determined that a test run would not be attempted due to the possibility of not having control of the throttle.

- The spark plugs were removed and examined. No mechanical damage with varying color.
    - T1: Wet, oil soaked
    - T2: Dry and dark gray
    - T3: Wet, black with deposits of corrosion
    - T4: Wet with clean oil
    - B1: Wet with clean oil
    - B2: Dry, dark gray, clean
    - B3: Dry, dark gray, clean
    - B4: Dry, dark gray, clean

Thumb force compression was present on cylinders 1, 2, and 4. Cylinder 3 had weak compression. Bore scoping the #3 cylinder revealed deposits on both valve seats.

Left magneto: Remained attached to the mount, and appeared normal, with no damage. The magneto sparked on the four posts. The impulse coupler operated normally. Right magneto remained attached at the mount, appeared normal, and produced a very weak spark on the four posts. All magneto to spark plug leads appeared normal and remained connected to their respective posts and spark plugs. Checked the timing of the magnetos, and verified the timing was set at 20° BTDC of the #1 cylinder, and within 1° of the right mag.

Verified valve train continuity by rotating the crank and observing movement of the rocker arms. All rocker arms moved up and down about the same height. All rocker box cavities contained fresh oil and exhibited no evidence of corrosion, or metal contaminants in the oil.

The carburetor, model 4A-3PA, serial number 75B-64415, remained attached to the intake manifold. The fuel hose from the gascolator to the carburetor remained secured at both ends. When removed, there was a rust-colored liquid trapped inside the hose, at the carburetor, that tested positive for water. The throttle cable remained attached to the throttle valve arm and the throttle control handle. The throttle cable from the firewall to the carburetor was bent and restricted the throttle from free movement and limited the travel of the throttle cable. The throttle arm for the intake butterfly valve was loose and moved fore and aft about 1/16”
The upper portion of the carburetor above the bowl contained corrosion. The carburetor bowl was dry but contained a rust-colored sediment at the lowest portion of the bowl. The floats

exhibited normal appearance and moved freely. Contaminants were observed in the needle area of the float assembly area. The accelerator pump piston and well was clean. The mixture cable remained attached the carburetor and the mixture control handle.

The gascolator remained attached to the firewall. When opened the gascolator bowl was dry and contained contaminants and residue. The gascolator screen filter contained a white powdery residue that obstructed about 30% of the screen surface. The stem running the bottom of the gascolator bowl had a large amount of corrosion attached to it. The fuel tubing from the gascolator to the fuel selector switch was secured at both ends.

The fuel selector switch was in the open position. When disassembled for examination there was no smell of fuel and a light deposit of a whitish material in the valve housing. The aluminum tubing from the fuel shutoff valve to the fuel tanks was fractured, separated, and deformed to about 50% closed.

The air filter was secure to the carburetor intake tube.

The oil filter was removed, cut open and revealed clean oil with no metal particles in the pleats of the paper filter

The vacuum pump turned freely.

The intake tube from the intake manifold to the cylinders remained attached at both ends and exhibited normal appearance, with no dents or deformity. The intake plenum and filter remained attached to the carburetor and appeared normal with no damage.

The number 1, 3 and 4 exhaust tubes appeared normal with no dents or deformity. The number 2 exhaust tube had a minor dent.

The muffler remained attached to the engine and appeared normal with no damage. All tubes and hoses remained attached to the muffler and had no damage. The muffler was removed and appeared normal with no internal damage or obstructions observed.

PHOTO ARRAY

Figure 1. N757PY, right-side view.


Figure 2. N757PY, right-side view of right wing and strut.

Figure 3. Left-side view of aft fuselage and empennage.


Figure 4. Left horizontal stabilizer and elevator.

Figure 5. Bottom view of fuselage and wings.

Figure 6. Bottom view of left wing, aileron, and flap.

Figure 7. Top view of the left wing, aileron, and flap.

Figure 8. Bottom view of the separated section of the right wing and aileron.

Figure 9. Top view of the separated section of the right wing, showing the leading edge.

Figure 10. Right view of the engine, engine nacelle, and propeller.

Figure 11. View of the instrument panel and throttle quadrant.

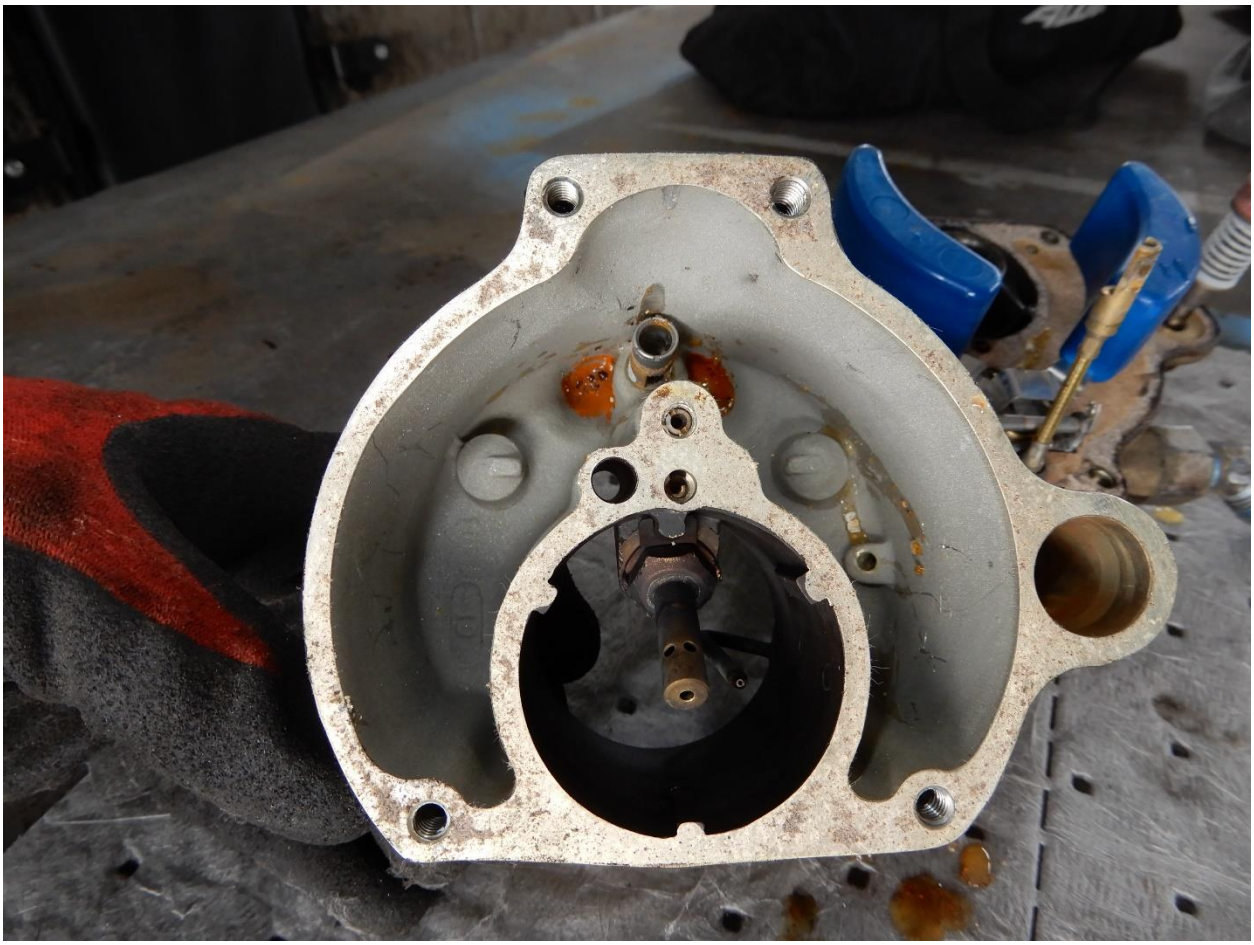
Figure 12. Carburetor bowl showing rust colored sediment at the bottom of the bowl.

Figure 13. Inside view of the gascolator bowl, showing water residue.

Figure 14. Right-wing fuel tank, showing glass jar with fluid removed from tank.

Figure 15. Fluid removed from right-fuel tank with Sargel compound indicating the presence of water.

Figure 16. Fuel line to the carburetor, showing presence of water.